REMARKS

Claims 11-14, 28-30, 44-75, 77-88 and 95 are pending, all of which stand rejected. Claims 11, 14, 28, 29, 44, 50 and 75 have been amended. Claims 45, 54 and 76 have been canceled, and Claim 99 has been added.

As requested, the title has been amended to be more descriptive of the claimed invention.

The specification has been amended to correct the informality noted by the Examiner as well as other errors which the applicants have discovered.

Claims 44-53, 76 and 77 were rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to make and/or use the invention. The Examiner pointed to the following limitations in particular:

Claim 44: "said objective end being spaced from said disk a distance of at least about 50 micrometers".

Claim 49: "said drive has a mass less than or equal to about 0.05 kg".

Claim 50: "said drive fits within a rectangular envelope having a thickness less than or equal to about 10 mm".

Claim 51: "said drive fits within a rectangular envelope having a width less than or equal to about 60 mm".

Claim 52: "said drive fits within a rectangular envelope having a depth of less than or equal to about 50 min".

Claim 95: "said drive having a thickness less than or equal to about 12 mm, a width less than or equal to about 55 mm and a depth less than or equal to about 40 mm".

Claim 76: "said rotation about said second axis imparts a moment of inertia of less than or equal to about 5 gm-cm^2".

Claim 77: "said rotation about said second axis imparts a moment of inertia of less than or equal to about 1 gm-cm^2".

It is respectfully submitted that two separate, albeit related issues, are involved here.

LAW OFFICES OF
SKJERVEN MORRILL
MACPHERSON LLP

25 METRO DRIVE
SUITE 700
SAN JOSE, CA 95110
(408) 453-9200
FAX (408) 453-7979

With respect to Claim 44 the issue is operability. Strictly speaking, a person of skill in the art would know *how* to construct a drive in which the objective end is spaced from the disk *any* distance of more than 50 micrometers; the issue is that at some point the drive would probably cease to function properly. Nonetheless, there are numerous embodiments where the objective/disk separation is greater than 50 micrometers *and* the drive *would* function properly. One skilled in the art would know, or could determine without undue experimentation, how far apart the objective and disk could be without affecting the operability of the drive.

> The presence of inoperative embodiments within the scope of a claim does not necessarily render a claim nonenabled. The standard is whether a skilled person could determine which embodiments that were conceived, but not yet made, would be inoperative or operative with expenditure of no more effort than is normally required in the art. *Atlas Powder Co. v. E.I. du Pont de Nemours & Co.,* 750 F.2d 1569, 1577, 224 USPQ 409, 414 (Fed. Cir. 1984) (prophetic examples do not make the disclosure nonenabling)." MPEP § 2164.08(b).

The rejections of Claims 49-52, 76 and 95 were presumably based on the fact that enablement would be an issue as the mass, thickness, width, depth, and moment of inertia of the drive become too small, e.g., approach zero.[1] Again, it appears that an absolute rule does not apply in this situation.

> "Claims are not rejected as broader than the enabling disclosure under 35 U.S.C. 112 for noninclusion of limitations dealing with factors which must be presumed to be within the level of ordinary skill in the art; the claims need not recite such factors where one of ordinary skill in the art to whom the specification and claims are directed would consider them obvious. *In re Skrivan*, 427 F.2d 801, 806, 166 USPQ 85, 88 (CCPA 1970). One does not look to the claims but to the specification to find out how to practice the claimed invention." MPEP § 2164.08.

Applicants submit that one skilled in the art would know, or could determine without undue difficulty, what are the lower limits of the recited parameters. The MPEP, § 2164.08, cites with approval the following language; "[T]o provide effective incentives, claims must adequately protect inventors" (citing *In re Goff*, 542 F.2d 564, 567, 1919 USPQ 429, 431 (CCPA 1976). To require applicants to specify lower limits for the recited parameters would provide a roadmap for potential infringers.

LAW OFFICES OF
SKJERVEN MORRILL
MACPHERSON LLP

25 METRO DRIVE
SUITE 700
SAN JOSE, CA 95110
(408) 453-9200
FAX (408) 453-7979

1 The Office Action also rejected Claim 53 under 35 U.S.C. § 112, first paragraph. The Applicants presume that this was a mistake since the rejection does not seem to apply to Claim 53.

Claims 11-14, 28-30, 75, 78-80, 85, 87 and 88 were rejected under 35 U.S.C. § 102(b) as being anticipated by Berg.

Claim 11 has been amended to recite "said first-surface recording medium comprising a phase-change recording layer" and "said laser light causing said recording layer to change from an amorphous phase to a crystalline phase at said medium positions". Berg is concerned with a "magneto-optic disk drive" (col. 1, line 13, and thus Claim 11 as amended clearly overcomes the rejection under 35 U.S.C. § 102(b). Claims 12 and 13 depend from Claim 11 and are therefore also allowable.

Claim 14 has been amended to recite "said medium containing data formed in a recording layer of said medium by stamping and/or molding during the manufacture of said medium". Berg does not teach or suggest the use of a medium of this description.

Claim 28 has been amended to recite that "said medium contains a recording layer comprising a material that changes from an amorphous phase to a crystalline phase when exposed to thermal energy". As stated above in connection with Claim 11, Berg does not teach or suggest this limitation.

Claim 29 has been amended to recite a "means for detecting changes in an intensity of light reflected from said medium". In contrast, as Berg explains, magneto-optic drives detect "[t]he polarization of the laser beam portions reflected from bit positions on the optical disk" (col. 1, lines 56-58). Claim 30 depends from Claim 29 and is likewise allowable.

Claim 75 has been amended to recite "wherein the location and mass of components of said arm are such that said rotation about said second axis imparts a moment of inertia of less than or equal to about 5 gm-cm^2". Enclosed herewith is a declaration by Thomas E. Berg, the inventor of the Berg patent (hereinafter "the Berg declaration"), which states unequivocally that it would not have been obvious to a person of average skill in the art how to fabricate a disk drive satisfying the limitation of Claim 75 at the time when this application was filed. Among other things, Mr. Berg points out that the focusing mechanism included in prior art optics arms would make it difficult to fabricate an optics arm having "a moment of inertia of less than or equal to about 5 gm-cm^2".

Claims 78-80 depend from and further limit Claim 75 and are therefore allowable for the same reasons.

LAW OFFICES OF
SKJERVEN MORRILL
MACPHERSON LLP
25 METRO DRIVE
SUITE 700
SAN JOSE, CA 95110
(408) 453-9200
FAX (408) 453-7979

Claim 85 recites, among other things, "wherein said moving is performed while maintaining at least said laser source and said objective in a fixed spatial relationship with respect to one another". This limitation is supported, for example, at page 26, lines 4-5, of the specification. In contrast, Berg teaches that "[l]ens support 168 and objective lens 170 are thereby *driven* against the bias force of springs 200 and *positioned* along focus axis 23 to focus laser beam 160 onto disk 36" (col. 11, lines 22-25) (emphasis added). Objective lens 170 is a part of focus and bias field switching assembly 150 which, along with laser diode 142, is "mounted to rotary arm 70" (col. 9, lines 43-46). Thus the teaching of Berg is directly contrary to the above-quoted limitation of Claim 85.

Claim 87 recites, among other things, "a focus actuator for controllably pivoting said optical arm about an axis substantially parallel to said disk plane for adjusting focus of light from said laser source on said disk". This limitation is supported, for example, at page 26, lines 1-4, of the specification. Berg focuses the laser beam as described above, and the above-quoted limitation of Claim 87 is nowhere found in Berg.

Claim 88 recites, among other things, "a focus actuator for controllably translating said optical arm in a direction substantially parallel to said first axis for adjusting focus of light from said laser source on said disk". The "first axis" is defined as the axis about which the disk rotates. As described above, Berg focuses the laser beam in an entirely different manner.

Claims 44-53 were rejected under 35 U.S.C. § 102(e) as being clearly anticipated by Hajjar et al.

Claim 44 recites, among other things, "said objective end being spaced from said disk a distance of at least about 50 micrometers." This limitation is supported, for example, at page 15, lines 8-9, of the specification. In contrast, Hajjar et al. teach a "'near-field' configuration," in which "the flying head 230 and the optical medium 270 are positioned relative to each other so that the optical spacing therebetween is less than one wavelength of the light produced by light source 210" (col. 3, lines 54-58). This represents a difference of approximately two orders of magnitude. Thus Hajjar et al. operate in an entirely different regime from the Applicants insofar as the spacing between the objective end and the disk is concerned.

Also, Claim 44 has been amended to recite "wherein said arm is further mounted for controllably moving said objective end along a path to adjust the distance of said objective

LAW OFFICES OF
SKJERVEN MORRILL
MACPHERSON LLP

25 METRO DRIVE
SUITE 700
SAN JOSE, CA 95110
(408) 453-9200
FAX (408) 453-7979

end from said disk for focusing said laser light", a limitation which is not taught or suggested by Hajjar et al.

Claims 45-53 depend from Claim 44 and therefore are allowable for this and other reasons.

Claims 68-70 were rejected under 35 U.S.C. § 103(a) "as being unpatentable over in view of [sic] Jewell et al. (US 5,808,986) in view of Berg (US 5,132,944)."

Claims 68-70 depend from and further limit Claim 58. The Examiner gave no rationale for the rejection of Claim 58 and therefore Applicants have no way of evaluating the rejection of Claims 68-70. Applicants note that Claim 58 recites, among other things, that "said laser light source and said detector are formed on a single integrated circuit substrate", and this limitation is not taught or suggested in either Jewell et al. or Berg. As is well known, an dependent claim includes all of the limitations of the base claim. Claims 68-70 are therefore allowable over the cited references.

Claims 44-54, 76, 77, 81-84, 86 and 96 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Berg.

Claim 44 has been amended to recite "wherein said arm is further mounted for controllably moving said objective end along a path to adjust the distance of said objective end from said disk for focusing said laser light". This limitation is not taught or suggested in Berg and this is clearly demonstrated by the Berg declaration.

Claims 46-53 depend from Claim 44 and are likewise allowable.

Claims 45 and 54 have been canceled.

Claim 76 depends from and further limits Claim 75, which has been amended to recite "wherein the location and mass of components of said arm are such that said rotation about said second axis imparts a moment of inertia of less than or equal to about 5 gm-cm^2". The Berg declaration indicates clearly that this limitation was not obvious at the time this application was filed.

Claims 77 and 81-84 depend from Claim 76.

Claim 86 recites, among other things, that "a distance, along an optical path from said laser source to said objective, remains substantially constant during said moving for adjusting focus". As stated above in connection with Claim 85, Berg teaches that "[l]ens support 168

LAW OFFICES OF
SKJERVEN MORRILL
MACPHERSON LLP

25 METRO DRIVE
SUITE 700
SAN JOSE, CA 95110
(408) 453-9200
FAX (408) 453-7979

and *objective lens* 170 are thereby *driven* against the bias force of springs 200 and *positioned* along focus axis 23 to focus laser beam 160 onto disk 36" (col. 11, lines 22-25) (emphasis added). Thus Berg does not teach the limitation of Claim 86.

Claim 96 recites, among other things, "said drive having a thickness less than or equal to about 12 mm". As the Berg declaration indicates, it would not have been obvious to a person of average skill in the art how to fabricate a disk drive having a "thickness less than or equal to about 12 mm" at the time this application was filed.

Applicants note that the Examiner gave no reasons for the rejection of Claims 55-67 and 71-74, as required by 35 U.S.C. § 132(a) and MPEP § 706.02(j). Applicants therefore presume that these claims were considered to be allowable.

For the reasons stated above, Claims 11-14, 28-30, 44-75, 77-88 and 95 are allowable. Should the Examiner wish to discuss any aspect of this application he is invited to telephone the undersigned at 408-453-9200.

EXPRESS MAIL LABEL NO: EL 937 076 792 US

Respectfully submitted,

Alan H. MacPherson
Attorney for Applicants
Reg. No. 24,423

LAW OFFICES OF
SKJERVEN MORRILL
MACPHERSON LLP

25 METRO DRIVE
SUITE 700
SAN JOSE, CA 95110
(408) 453-9200
FAX (408) 453-7979

Version with markings to show changes made

Amendments to the Specification

The paragraph beginning at page 8, line 13, is amended as follows:

Because the transparent layer 718 is typically formed from a non-conductive material, there is a significant risk that rotation or similar movement of the medium will create sufficient static electrical charge that dust particles or other debris may be attracted to (and/or [an/or] become difficult to remove from) the operational surface of the medium.

The paragraph beginning at page 10, line 25, is amended as follows:

The present invention includes a recognition of the existence and/or nature of certain problems [problem] in previous systems, including those discussed herein. The present invention provides a removable optical data recording cartridge which is configured to have relatively high capacity and relatively low weight, size and cost. In one aspect, the system includes writeable media and, preferably, an optical disk cartridge is configured for use in connection with a rotary actuator for data reading and writing. The system can be used in a number of manners including as part of a system for capturing and/or recording data (such as in a digital camera, audio or video recorder, and the like), as part of a system for playing or otherwise outputting data (such as displaying, recorded or "pre-recorded" images, video, audio or other information) or combinations thereof. According to one feature of the invention, the medium is a first-surface medium protected by an enveloping cartridge. Preferably the medium can be configured for recording on both surfaces and the cartridge is configured to permit actuator access through either of two opposed cartridge surfaces. The read/write surfaces of the disk are substantially sealed when the disk is removed from the drive.

The paragraph beginning at page 16, line 24, is amended as follows:

Although many configurations of first-surface media can be used in the context of the present invention, Fig. 7B provides an example of one configuration. In the illustration of Fig. 7B, a (multi-film) recording layer 740 includes a recordable dye or phase change film 742 sandwiched between two dielectric films 744a, b. A reflective film 746, adjacent the sandwich 744a, 742, 744b, is coupled by an adhesion film 748 to a substrate 752. In the illustration of Fig. 7B, the upper surface of the upper dielectric film 744a [744] defines the operational surface of the recording layer 740, i.e., is initially struck by the read/write beam

LAW OFFICES OF
SKJERVEN MORRILL
MACPHERSON LLP

25 METRO DRIVE
SUITE 700
SAN JOSE, CA 95110
(408) 453-9200
FAX (408) 453-7979

754. If desired, a thin coating (such as a few molecules thick) of carbon or other wear-resistant material (not shown) can be deposited on the operational surface of the medium.

The paragraph beginning at page 19, line 3, is amended as follows:

The adhesion <u>film(s)</u> [films(s)] 748 may be provided between films or layers which would have poor adhesion if placed in direct contact. An adhesion film 748 between the recording film and substrate 752 provides for potentially improved adhesion to the substrate, as well as modifying the properties of the recording film when it is deposited, such as <u>its</u> [it's] crystallite size in the case of a phase-change medium, which can lead to improved sensitivity and recording readout contrast. In addition, it can be part of the thermal optimization. For example, if the media is erasable phase-change, then it is desirable to control the rate of heat flow to the substrate of other layers. The adhesion film(s) may be as then as 2 -5 angstroms.

The paragraph beginning at page 13, line 26, is amended as follows:

As shown in Fig. 1, according to one embodiment, a removable, recordable optical storage cartridge 112 includes a rotatable writeable optical storage disk 114 surrounded by a cartridge body having an upper wall 116 and a lower wall 118 joined by a substantially rectangular side wall 122. In one embodiment, the medium is an InSbSn phase change medium, of a type used by Kodak, in connection with 14 inch optical write-once-read-many (WORM) disk products. Examples of suitable media are described in U.S. Patents 4,960,680 and 5,271,978<u>, which describe a recording layer which changes from an amorphous phase to a crystalline phase upon exposure to thermal energy, the reflectivity of the material in the crystalline phase being greater than the reflectivity of the material in the amorphous phase</u>. Such a medium is suitable as a first-surface medium. Such a medium is substantially pan-chromatic or "broadband," such that is can be used with a range of laser light frequencies (e.g., from 400 nm or less to 1100 nm or more wavelength), making it possible to use the invention described herein in connection with short-wavelength lasers (e.g., blue lasers), to achieve a smaller spot size (and thus higher data density) substantially without the need to modify the medium. It is anticipated that a disk 114 formed using such a medium will be substantially rigid. Another example of a medium that can be used in embodiments of the present invention is that described in U.S. Patent 4,816,841 to Kurary Plasmon Data Systems Co., Ltd., which is an example of a medium with a plastic substrate. Non-rigid media may, in some embodiments, be adhered to (or otherwise coupled to) one or both surfaces of a rigid substrate to provide a rigid, compound medium, or may be coupled to a semi-rigid (to provide

LAW OFFICES OF
SKJERVEN MORRILL
MACPHERSON LLP

25 METRO DRIVE
SUITE 700
SAN JOSE, CA 95110
(408) 453-9200
FAX (408) 453-7979

a semi-rigid, compound media) or left uncouple to a substrate to provide a non-rigid medium. As depicted in Fig. 8if the cartridge 112 is used in connection with a non-rigid or semi-rigid film-type disk, 812, the disk 812 is preferably provided with a separate hub 814 to define the center (e.g., for minimizing run-out). The hub 814 can also be useful in providing a seal between the central opening of the cartridge 816a, 816b and the disk 812, e.g., to avoid contact with or contamination of the data-bearing portions of the disk 812.

The paragraph beginning at page 29, line 24, is amended as follows:

During writing (at high power) and reading (when the laser power is reduced so as to ensure that no writing occurs), the beam is <u>reflected</u> [reelected] back from the disk 1707 with substantially a reversed direction of rotation of polarization. The power of the reflected beam will vary depending on whether or not the area of the recording layer on which the beam is focused, contains a previously-written spot. The reflected beam retraces its path through the objective lens 1706, prism 1705 and along substantially the same path 1712, Upon reaching the retarder 1704, the beam is converted to a horizontal linear polarization. When it encounters the birefringent component 1703, the beam shears in a horizontal direction, 1716, exiting the birefringent component as beam 1711, parallel to the original beam 1710, but displaced by a small amount 1812, such as about 100 to 200 micrometers. When the reflected beam enters the optic component 1702, it encounters an astigmatic element 1708, such as a cylindrical lens, before being projected onto the detector array 1714. If the astigmatic element 1708 is a cylindrical lens, then the detector array 1714 should be a conventional quadrant configuration.

LAW OFFICES OF
SKJERVEN MORRILL
MACPHERSON LLP

25 METRO DRIVE
SUITE 700
SAN JOSE, CA 95110
(408) 453-9200
FAX (408) 453-7979

Amendments to the Claims

11. (Amended) A method for optically recording data, comprising:

providing a user-removable cartridge having a optical first-surface recording medium mounted therein for rotation about a first axis, configured to provide optical access to at least a first arcuate region of said medium, said first-surface recording medium comprising a phase-change recording layer;

positioning said cartridge in a location adjacent an optical arm, said optical arm having an objective end and rotatable about a second axis[,];

rotating said optical arm about said second axis to position said objective end aligned with a plurality of desired arcuate positions along said arcuate region;

rotating said medium about said first axis to position a plurality of desired medium positions in alignment with said objective end; and

providing laser light along said optical arm to said objective end for diverting from said objective end to said plurality of desired medium positions in said recording layer, said laser light causing said recording layer to change from an amorphous phase to a crystalline phase at said medium positions.

14. (Amended) A method for optically reading comprising:

providing a user-removable cartridge having a optical first-surface [pre-recorded] medium mounted therein for rotation about a first axis, configured to provide optical access to at least a first arcuate region of said medium, said medium containing data formed in a recording layer of said medium by stamping and/or molding during the manufacture of said medium;

positioning said cartridge in a location adjacent an optical arm, said optical arm having an objective end and rotatable about a second axis;

rotating said optical arm about said second axis to position said objective end aligned with a plurality of desired [arcuate] positions along said arcuate region;

rotating said medium about said first axis to position a plurality of desired medium positions in alignment with said objective end; and

providing laser light along said optical arm to said objective end for diverting from said objective end to said plurality of desired medium positions; and

detecting at least a first characteristic of light reflected from said desired medium positions.

LAW OFFICES OF
SKJERVEN MORRILL
MACPHERSON LLP

25 METRO DRIVE
SUITE 700
SAN JOSE, CA 95110
(408) 453-9200
FAX (408) 453-7979

28. (Amended) Apparatus for [optically] recording data, comprising:

a cartridge having a optical first-surface recording medium mounted therein for rotation about a first axis, and defining a first shutter movable, via a mechanical linkage, between [from] a first position, substantially sealing said medium in said cartridge, and a second position, exposing at least a first arcuate region of said medium, means for assisting in positioning said cartridge in a location adjacent an optical arm, said optical arm having an objective end and rotatable about a second axis, wherein, in response to said positioning, said linkage automatically moves said shutter to said second position;

means for rotating said optical arm about said second axis to position said objective end aligned with a plurality of desired [arcuate] positions in [along] said arcuate region; means for rotating said medium about said first axis to position a plurality of desired medium positions in alignment with said objective end; and means for providing laser light along said optical arm to said objective end for diverting from said objective end to said plurality of desired medium positions,

wherein said medium contains a recording layer comprising a material that changes from an amorphous phase to a crystalline phase when exposed to thermal energy.

29. (Amended) Apparatus for reading optical data, comprising:

a cartridge having an optical first-surface medium mounted therein for rotation about a first axis, and defining a first window exposing at least a first arcuate region of said medium, means for assisting in positioning said cartridge in a location adjacent an optical arm, said optical arm having an objective end and rotatable about a second axis; means for rotating said optical arm about said second axis to position said objective end along said arcuate region;

means for rotating said medium about said first axis to position a plurality of desired medium positions in alignment with said objective end;

means for providing laser light along said optical arm to said objective end for diverting from said objective end to said plurality of desired medium positions; and

means for detecting changes in an intensity [at least a first optical characteristic] of light reflected from said medium.

LAW OFFICES OF
SKJERVEN MORRILL
MACPHERSON LLP

25 METRO DRIVE
SUITE 700
SAN JOSE, CA 95110
(408) 453-9200
FAX (408) 453-7979

44. (Amended) A drive for reading data on an optical media disk, said disk defining a plane, comprising: a spin drive for rotating said disk about a first axis;

an arm, having an objective end, mounted for rotating said arm about a tracking axis to position said objective end in alignment with any of a plurality of radial positions of said disk, said tracking axis being substantially parallel to and spaced from said first axis, said objective end being spaced from said disk a distance of at least about 50 micrometers; and

a laser light source configured to provide laser light along a path to said objective end of said arm and thence to said disk; and

an optical detector which detects light reflected from said disk;

wherein said arm is further mounted for controllably moving said objective end along a path to adjust the distance of said objective end from said disk for focusing said laser light.

50. (Amended) A drive, as claimed in claim 44, wherein said drive fits within a rectangular envelope having a thickness less than or equal to about 12 [10] mm.

75. (Amended) Apparatus for optical data storage comprising:

a rotatable, user-removable disk;

a drive, couplable to said disk, for rotating said disk about a first axis;

an optics arm having at least a laser source, a detector, an objective and a focus actuator,

and defining an objective end and a second end;

a tracking actuator, coupled to said arm to controllably rotate said arm about a second axis, substantially parallel to, but spaced from said first axis, to position said objective end at desired radial locations adjacent said disk,

wherein the location and mass of components of said arm are such that said rotation about said second axis imparts a moment of inertia of less than or equal to about 5 $gm\text{-}cm^2$.

LAW OFFICES OF
SKJERVEN MORRILL
MACPHERSON LLP

25 METRO DRIVE
SUITE 700
SAN JOSE, CA 95110
(408) 453-9200
FAX (408) 453-7979